Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

any point is equal to that which would be produced by a wire of the same weight per unit length, hanging vertically and being of the same length as the ordinate of the point where the tension is measured, the equation of the curve being of the form,

$$y = \frac{a}{2}(e^{x/a} + e^{-x/a}).$$

Hence, the equation of the catenary curve assumed by the wire in the above problem will be

$$y = 700(e^{x/1400} + e^{-x/1400}),$$

the unit of distance being one yard.

The amount of dip or sag in a symmetrical segment of horizontal projection, $2h$, will be

$$d = \frac{a}{2}(e^{h/a} + e^{-h/a}) - a$$

$$= \frac{h^2}{2a} + \frac{h^4}{24a^3} + \frac{h^6}{720a^5} + \cdots.$$

In our problem $d = 1$, $a = 1400$, and a very close first approximation is given by neglecting all terms in the series after the first. Hence, $h = 52.915$, approximately. Using more terms the result correct to three places is $h = 52.912$. The distance between the poles, correct to the nearest tenth of a foot is 317.5 feet.

Also solved by ROGER A. JOHNSON.

2671. Proposed by ARTEMAS MARTIN, Washington, D. C.

Find two rectangular parallelopipedons whose edges are rational whole numbers and whose solid diagonals are also rational whole numbers and equal.

SOLUTION BY S. A. COREY, Albia, Iowa.

We have the identities

$$\begin{aligned}(x^2 + y^2 + u^2 + v^2)^2 &= (x^2 - y^2 - u^2 + v^2)^2 + (2xy - 2uv)^2 + (2ux + 2vy)^2\\ &= (x^2 - y^2 + u^2 - v^2)^2 + (2xy + 2uv)^2 + (2vx - 2uy)^2\\ &= (x^2 + y^2 - u^2 - v^2)^2 + (2ux - 2vy)^2 + (2vx + 2uy)^2.\end{aligned}$$

By letting x, y, u, and v represent rational whole numbers any number of solutions of the problem may be obtained. One such solution is obtained by letting $x = 1$, $y = 2$, $u = 5$, and $v = 7$, and we find *three* parallelopipedons fulfilling the requirements of the problem, with edges 21, 66, 38; 27, 74, 6; and 69, 18, 34, respectively, the solid diagonal of each being 79. The three smallest have edges, 1, 2, 2; 2, 4, 4; and 2, 3, 6, respectively.

Also solved by L. E. LUNN, W. P. DURFEE, and H. L. OLSON.

2673. Proposed by WILLIAM O. BEAL, University of Minnesota.

A plane through the center of an oblate spheroid makes an angle, i, with the plane of its equator. Express the eccentricity, e', of this section in terms of the eccentricity, e, of a meridian section and the angle, i.

SOLUTION BY C. A. BARNHART, Colorado College.

Let the equation of the oblate spheroid be $x^2/b^2 + y^2/b^2 + z^2/a^2 = 1$, $(b > a)$, of which the z-axis is the axis of revolution. Let $OP = b'$ be the semi-minor axis of the given plane section of which b is the semi-major axis. Then P will be a point on the meridian section, which may be assumed to lie in the yz-plane and to have the parametric equations:

$$z = a \sin \theta, \qquad y = b \cos \theta;$$

and the eccentricity,

$$e = \frac{\sqrt{b^2 - a^2}}{b}.$$